Hash Management Services LLP

Our Experience in
Lean Manufacturing Implementation

P. Ananth
Hash Management Services LLP
Chennai
Some of the issues faced by Manufacturing Industries

• On time delivery
• High rejection / rework
• Cost Pressure / Rising Costs
• Frequent customer complaints
• Stock management
• High set-up time for machines
• Frequent schedule changes by customers
• Labour availability and Skill level
Lean Manufacturing would solve most of these issues

- On time delivery - *by improving the through-put*
- High rejection / rework - *by improving quality*
- Frequent customer complaints - *by improving quality*
- Stock management - *by implementation of 5S*
- High set-up time for the moulding machines - *by SMED*
- Frequent schedule changes by the customer - *by Kanban and Replenishment Model*
Work Vs. Waste

Traditional Thinking:
- 100% work

Lean Thinking:
- 10% Work
- 90% Waste

Searching of tools, waiting, inventory, defectives & rework, movement, Loading and unloading time, set-up time, inspection. etc

Actual change happening in the product
Lean Manufacturing

A systematic approach to identifying and eliminating waste (non-value-added activities) through continuous improvement by creating flow of the product or service at the pull of the customer.
Consultants, Lean Manufacturing & Supply Chain Management

We work with medium and large scale manufacturing companies helping them improve their operations and profitability.

We work on:

- Improving **Productivity**
- Improving **On-Time Delivery** Performance
- Reducing **Inventory Holding**
- Improving **Quality - First Time Acceptance** Level

In general, our clients experience **30% to 50% improvement in Productivity** after our engagement.
What we do?

Areas of Excellence

Lean Manufacturing Implementation, Supply Chain Re-Engineering, Inventory Optimization, Operational Excellence, Production Planning and Business Process Re-Engineering engagements

Sectors worked

Leather and Footwear, Rubber Products, Auto Ancillaries, Fabrication, Machining, Castings and Forgings, Iron and Steel, Medical Equipments, Electronic Components, Heavy Engineering, Plastics, Electrical Appliances Manufacturing and more.

Few of our Clients

Paragon Polymer Products, Venus Home Appliances, Kelachandra Group, GA Industries, Falcon Agencies, United Industries, Glenrock Rubber Products and more. We are also working with CII, FICCI and ILO on various programmes to improve competitiveness of manufacturing sector.

(C) Property of Hash Management Services LLP
Projects Handled:

More than 50 clients in the last 6 years. Few of them mentioned below:

• Lean Manufacturing & 5S Implementation in India’s largest footwear manufacturer

• Lean Implementation and Layout Redesign at one of India’s Largest Water heater Manufacturer

• 5S Implementation at Leather Goods manufacturer based in Chennai

• Operational excellence and Lean implementation to 40 units of Auto & Auto ancillary (Tier 1 suppliers to TAFE & Royal Enfield)

• Operational Excellence in a large Rubber Mat Exporter based in Kerala

• 5S and Supply Chain Management in Warehouses of India’s largest footwear manufacturer

• Lean Manufacturing Implementation at one of Kerala’s largest PVC pipe and Fittings manufacturer

• Supply Chain Re-engineering in one of India’s largest heavy equipment manufacturer

• Operational Excellence and Layout Redesign at one of the world’s largest ATM machine manufacturer

• Associated in the implementation of Lean Manufacturing cluster in Coimbatore (jointly with another consulting company) supported by NPC
Testimonials

“Improvement of 12.5% in turnover, Motivated employees, Well organised and clean factory” - Mr. Titten Thomas, Director, Kelachandra Pipe Industries.

“Very Good improvement is observed. Our Supervisors and workers getting more confident and sustaining the initiatives. Many of our units reported 30% improvement in Productivity”- Mr. Narayanan, Senior General Manager, Paragon Polymer Products (P) ltd.

“Now we are able to make about 12 to 16 dryers a day in the cell where we were making about 7 to 8 a day.” – General Manager, Coimbatore based Industrial Refrigeration Systems Manufacturer

“All the machines were arranged in the operation sequence and the conveyor is removed to facilitate Single Piece flow. Our average dispatch increased from 70,000 pairs/month to 92,000 pairs/month. Factory became more hygienic and clean. No semi-finished stock is left in the factory at the end of shifts.”

- Thara John, Proprietor, J M Industries (Supplier to Paragon Polymer Products (P) Ltd.)
Testimonials from Clients

Dear Mr. P. Ananth,

Sub: Testimonial

As per the Lean manufacturing consultancy the 5S and SMED Programs you have conducted in our organization from February 2014 to June 2014 has resulted in the following improvements:

1) Well organized and cleaned factory environment
2) Motivated employees
3) Due to SMED there has been an improvement of 12.5% in total turn over.
4) Set up time reduced to 75%

He has been quite economical and effective. We wish him all the best.

For Kelachandra Pipe Industries
Managing Partner

PARAGON POLYMER PRODUCTS PVT. LTD.

Dear Mr. P. Ananth,

The Lean Manufacturing program you had conducted between November 2012 and August 2013 was really useful in improving our productivity and we could see a lot of improvements in our shop floor. Our production area, Engineering stores and Raw Material stores were looking neat and organized. Our EVA setup time reduced to less than 20 minutes.

Similarly, we can see a good improvement from our sub-contracting units like Jaite, Gallant and Stitching units, Seban Industries, JNM Industries, Hi Tech, Ideal and KAN Enterprises. All these units reported an improvement of nearly 50% in productivity.

We congratulate for the work you have done for Paragon Polymer Products (P) Ltd, and wish to continue working with you in the future.

Wishing you all the best.

For Paragon Polymer Products (P) Ltd.
Sr. General Manager - Production.
Lean Tools Used:

- Single Minute Exchange of Dies (SMED)
- Continuous Flow / Single Piece Flow
- 5S
- Kaizen Blitz
- Line Balancing
- Value Stream Mapping (VSM)
- Just in Time (JIT)
- Visual Control
- Layout design to enable Single Piece Flow
Single Piece Flow Implementation at 27 Stitching Units of Paragon

Before project: Aug 2015

Total Production per day: 38000 pairs

After project: Jan 2016

Total Production per day: 60000 pairs

57% Improvement

Project Duration: Aug 2015 to Jan 2016
Units covered: 27 units supplying to Paragon
Location: Kottayam, Kerala
**Client Name:** Seban Industries, One of the suppliers of Paragon Polymer Products, Kottayam. Project supported by Paragon.

<table>
<thead>
<tr>
<th>Lean Tools used: Single Piece Flow / Continuous Flow, Kaizen Blitz and Value Stream Mapping (VSM)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Situation / As-Is Situation</strong></td>
</tr>
<tr>
<td>Average Per day production is 900 pairs. All the machines and people are arranged in Process layout leading to very high Work In Progress (WIP). Huge batches leading to confusions in the sizes of the footwear and the left/right footwear status</td>
</tr>
<tr>
<td><strong>Activity Done:</strong> Training the team members on Lean manufacturing for 3 hours. Quick analyses of the product / process flow by the team members leading to a Value Stream Mapping (VSM). Changing the layout to suit the product movement and enabling continuous flow thus increasing the throughput</td>
</tr>
<tr>
<td><strong>Final Situation / To-Be Situation:</strong> 33% improvement in productivity within 2 days. Average production increased to 1200 pairs per day. More than 200 sq.ft of space is released where the company installed 5 more machines to further increase the production</td>
</tr>
</tbody>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before Single Piece Flow</strong></td>
</tr>
<tr>
<td>900 pairs/day</td>
</tr>
<tr>
<td><strong>After</strong></td>
</tr>
<tr>
<td>1200 pairs/day</td>
</tr>
</tbody>
</table>
**Client Name:** JM Industries, One of the suppliers of Paragon Polymer Products, Kottayam. Project supported by Paragon.

**Lean Tools used:** Single Piece Flow / Continuous Flow, Kaizen Blitz and Value Stream Mapping (VSM)

<table>
<thead>
<tr>
<th>Current Situation / As-Is Situation</th>
<th>Before Single Piece Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Per day production is 2800 pairs. All the machines and people are arranged in Process layout leading to very high Work In Progress (WIP). Huge batches leading to confusions in the sizes of the footwear and the left/right footwear status</td>
<td>2800 pairs/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity Done:</th>
<th>2800 pairs/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training the team members on Lean manufacturing for 3 hours. Quick analyses of the product / process flow by the team members leading to a Value Stream Mapping (VSM). Changing the layout to suit the product movement and enabling continuous flow thus increasing the throughput.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Situation / To-Be Situation:</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>30% improvement in productivity within 2 days. Average production increased to 3600 pairs per day.</td>
<td>3600 pairs/day</td>
</tr>
</tbody>
</table>
Implementation of Flow Production at Stitching units of Paragon

Batch Production leading to high WIP between the operations

Layout is changed according to the product flow. Continuous flow production is practised
# SMED in Kerala’s largest Pipe Manufacturer

## Lean Tool Used: Single Minute Exchange of Dies (SMED)

<table>
<thead>
<tr>
<th>Current Situation / As-Is Situation</th>
<th>PVC Pipe Extrusion Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time taken is more than 3 hours for a change-over. Machine would be switched off and a buffer chemical is filled in to avoid the PVC chemicals’ charring.</td>
<td>Before SMED</td>
</tr>
<tr>
<td></td>
<td>3 Hours</td>
</tr>
<tr>
<td>Final Situation / To-Be Situation: Change over time reduced to 23 minutes from 3 hours. Machine was not switched off and the changeover could be completed before the PVC chemical starts charring. The new die was preheated and installed in the machine as against the earlier case where the dies are heated for nearly 1 hour leaving the machine idle</td>
<td>After SMED</td>
</tr>
<tr>
<td></td>
<td>23 Minutes</td>
</tr>
</tbody>
</table>

**Result:** Increase of 6000m of pipe production observed in 1 week, translating to more than 24000m of increased production per month
# SMED in Kerala’s largest PVC Pipe Fittings Company

## Lean Tool Used: Single Minute Exchange of Dies (SMED)

<table>
<thead>
<tr>
<th>Current Situation / As-Is Situation</th>
<th>Before SMED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time taken is more than 4 hours for a change-over. A lot of wastages in fine tuning and adjustments during the setting</td>
<td>4 Hours</td>
</tr>
</tbody>
</table>

**Activity Done:** Training the team members on SMED for 3 hours. Formation of an SMED trolley. Video taken on the current situation is analyzed and the activities are categorized into Internal and External activities. Most of the external activities are eliminated and the Internal activities are reduced based on the suggestions from the team. Usage of pneumatic tools, usage of multiple material handling equipment, marking of the exact location of the punch and die in the machine to avoid adjustments

<table>
<thead>
<tr>
<th>Final Situation / To-Be Situation:</th>
<th>After SMED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change over time reduced to 45 minutes from 4 hours. All the external activities were completed before stopping the machine and the time taken for internal activities were reduced using pneumatic tools and CNC programming</td>
<td>45 Minutes</td>
</tr>
</tbody>
</table>

**Result:** A 12.5% increase in productivity observed after the SMED is implemented. Currently it is being horizontally deployed across all injection moulding machines.

(C) Property of Hash Management Services LLP
Inventory Reduction at Tier 1 Supplier to India’s largest Tractor Manufacturer and having 1000 child parts

Before

Inventory Turns
9

After

Inventory Turns: 13
5S Implementation - recovered 200 sqft

Project Duration: 12 months; year 2011
Units covered: Tier 1 Supplier to India’s largest Tractor Manufacturer
Location: Chennai, Tamil Nadu
Productivity Improvement at Welded components unit - Tier 1 Supplier to India’s largest Tractor Manufacturer

Before

Per day output 190 nos

By Single Piece Flow, Layout redesign, Workstation design

After

Per day output 230 nos

21% Improvement

Project Duration: 12 months; year 2013-14
Units covered: Tier 1 Supplier to India’s largest Tractor Manufacturer
Location: Chennai, Tamil Nadu
Quality Improvement at Tier 1 Supplier to India’s largest Brakes Manufacturer supplying Brake-rods

Before

9000 PPM

After

1200 PPM

By Pareto Analysis, FishBone Diagram, WhyWhy Analysis, Poka-Yoke

86% reduction in defects

Project Duration: 12 months; year 2013-14

Units covered: Tier 1 Supplier to India’s largest Brakes Manufacturer

Location: Chennai, Tamil Nadu
On-Time Delivery (OTD) Improvement at camshaft unit - Tier 1 Supplier to India’s largest Tractor Manufacturer

Before

OTD 56%

After

By Purchase Planning, Production Planning, and Visual Kanban

OTD 90%

Project Duration: 12 months; year 2013-14

Units covered: Tier 1 Supplier to India’s largest Tractor Manufacturer

Location: Chennai, Tamil Nadu
Stickers were kept in boxes without identification. Time and effort to search the stickers.

Size-wise and article-wise arrangement of stickers to reduce searching of the same.
5S Implementation at various clients

Moulds were kept on the floor without identification

Size-wise and article-wise identification for moulds. Each color represents a particular size
5S Implementation at various clients

No arrangement of tools in the shop floor

Tools were arranged by the operators for easy retrieval and usage
5S Implementation at various clients

No arrangement of tools in the shop floor

Tools were arranged by the operators for easy retrieval and usage
JIT production - reduced WIP

Presence of semi-finished items (Loose pairs) in the shop floor

Inline packing to eliminate Loose pairs and improve on-time delivery
Principal Consultant, **Lean Manufacturing & Supply Chain Management**

Experience: 10 years

**Sectors Worked:** Leather and Footwear, Auto Ancillaries, Fabrications, Castings and Forgings, Steel, Medical Equipments, Electronic Components, Heavy Engineering, Plastics, Electrical Appliances Manufacturing and more.

Phone: + 91 91766 13965  
Email: pananth@hashllp.com  
Website: [www.hashllp.com](http://www.hashllp.com)

**Areas of Excellence**  
Lean Manufacturing, Supply Chain Re-Engineering, Inventory Optimization, Operational Excellence, Business Process Re-Engineering & Market Assessment studies
Past Experience

- Consultant - Deloitte Touche Tohmatsu, Chennai
- Senior Engineer - Titan Industries Ltd, Hosur

Academic Qualifications

- PGDM (Operations & Marketing) - Institute For Financial Management and Research (IFMR), Chennai
- B.E (Mechanical) - Government College of Engineering, Tirunelveli

Other Details

- Empanelled consultant with National Productivity Council (NPC) for undertaking Lean Manufacturing Initiatives
- Working jointly with ILO in implementing Sustaining Competitive and Responsible Enterprises (SCORE) program in Chennai for Auto-ancillaries
- Active networker. Member of Madras Management Association, BNI, TIE, Chennai Open Coffee Club and other related forums
T. Divakar

Consultant, Lean Manufacturing & Supply Chain Management

Experience: 7 years (5 years in Management Consulting)
Academic Qualification: B.E. (Mechatronics) - Anna University
PGDM (Finance) - LIBA
Sectors Worked: Auto & Auto ancillaries (Casting, Machining, Fabrication, Forging, & Rubber products), Industrial Fibres, ATM manufacturing

Phone: + 91 98949 83883
Email: divakar@hashllp.com
Website: www.hashllp.com

Areas of Excellence

• Lean Manufacturing & Operational Excellence engagements
• Worked with more than 40 SME’s in improving their overall Competitiveness
• Market Research and Supply Chain Management
Past Experience

- Consultant - Krysalis Consultancy Services, Chennai
- Application Engineer - Inteltek Automation Pvt Ltd, Bangalore

Academic Qualifications

- PGDM (Finance) - LIBA, Chennai
- B.E (Mechatronics) - Anna University, Chennai

Other Details

- Certified Practitioner for Material Flow Cost Accounting, issued by Gujarat Productivity Council
Our Experience in Lean Manufacturing Implementation

P. Ananth
Hash Management Services LLP
Chennai

Apr 2016